Contract Group H

Evaluation Report:
PG&E Agricultural and Food Processing Program; Greenhouse Heat Curtain and Infrared Film Measures

Volume 4: Appendix E, Public Comments and Responses

CALMAC Study ID: CPU0024.03

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For the
California Public Utilities Commission, Energy Division

February 10, 2010

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E PG&E Agricultural and Food Processing Program Response to Non-Confidential Comments

This appendix contains comments on the PG&E Ag-Food evaluation report and the evaluation teams' responses. PG&E was the only entity commenting on the report. This section includes responses to PG&E's non-confidential comments. Note that responses to PG&E's comments that contain confidential customer-specific information will be provided to PG&E under separate cover.

E.1 Response to PG&E Non-confidential Comments

Date	Author	Subject	Section/Page	Attachment	Issue Resolution
01/11/2010	**PG&E Company**	**General**	**PG&E Cover Letter**	**view attachment**	**Add Note**
	Comment:	PG&E's Cover Letter and Public Comments/Questions Addressing the PG&E Agricultural and Food Processing Draft Report.			
	Response:	1. A copy of PG&E's cover letter with responses is provided at the end of this document.			
01/11/2010	**PG&E Company**	**Site Specific**	**Site Specific Report**		**Add Note**
	Comment:	PG&E has comments to the Site-Specific Measurement and Evaluation Reports that were not publicly-posted by the Energy Division. The comments refer to and discuss the information in the non-public site-specific reports, and also contain confidential, market sensitive, proprietary customer information, which if publicly disclosed could place PG&E's customers at a competitive disadvantage. Therefore, rather than post these comments publicly, PG&E is submitting Attachment B under separate cover to Energy Division pursuant to California Public Utilities Code section 583 and General Order 66-C.			
	Response:	2. Responses to site-specific comments have been provided to PG&E.			
01/11/2010	**PG&E Company**	**Ag**	**VIII**		**Add Note**
	Question:	Can you clarify how you calculated the relative precision?			
	Answer:	3. Relative precision is calculated as 1.654 times the standard error divided by the mean.			
01/11/2010	**PG&E Company**	**NTGR**	**ix**		**Add Note**

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	Question:	Table 2&3 - NTGR for kWh same as for gas; Did you simply apply the NTGR for gas? In these projects no kWh had been claimed; is it ok to apply gas NTGR?			
	Answer:	4. The gas-savings weighted NTGR was applied to the kWh savings. The gas-weighted NTGR provides the best estimate of the likelihood that the program caused the impact.			
01/11/2010	**PG&E Company**	**General**	**1**		**Add Note**
	Question:	Who are ERS Inc and Robert Thomas Brown Co? What part of the evaluation did they do?			
	Answer:	5. ERS is an engineering firm. Robert Thomas Brown Co. is Disabled Veteran Business Enterprise with expertise in market research, feasibility and impact studies, and training and development. ERS conducted site work and engineering analysis. Robert Thomas Brown Co. conducted site work.			
01/11/2010	**PG&E Company**	**Data collection timeframe**	**1**		**Add Note**
	Question:	The evaluators claim the evaluated program was for entire 2006-08 period. However, in other parts the evaluators talk about having done the on-site assessments during a very short time period. Can you provide details on how you sampled sites from each year to develop a representative sample? Please explain what measures were taken to ensure that the final sampling (which in some cases resulted in less than desired participation rates) is representative of the entire 2006-08 participant mix?			
	Answer:	6. A stratified ratio estimation approach was used for the sample design. This approach was applied to all the projects in the 2006-08 period without regard to year. Projects were spread across the years in a random fashion.			
01/11/2010	**PG&E Company**	**Hourly profiles**	**1**		**Add Note**
	Question:	Can you provide more detail to support the validity of your hourly profiles and the modeling of these? You calibrated to a very small group of sites and short-term metered data.			
	Answer:	7. Documentation was provided as part of the evaluation report. In addition, we responded to all PG&E data requests that were submitted subsequent to filing of the draft report.			
01/11/2010	**PG&E Company**	**Peak demand and spillover calculations**	**1 & 3**		**Add Note**
	Question:	How did you define peak demand effects? Over what time period? You also say you did this for spillover, yet we do not see any calculations or documentation on how spillover was determined and applied. Was this the only spillover you			

Date	Author	Subject	Section/Page	Attachment	Issue Resolution
		found for kWh, or kW that occurred in greenhouse HIMs gas projects? Where are these spillover savings shown? Only in the site reports? Why not in an overall table?			
	Answer:	8. The definition of peak was determined through CPUC policy. See D. 06-06-063, OP 1: "Until further notice of this Commission, the definition of peak kilowatt (kW) contained in the 2005 Database for Energy Efficient Resources (DEER) shall be used for the purpose of verifying energy efficiency program and portfolio performance. As discussed in this decision, DEER defines peak demand as the average grid level impact for a measure between 2 p.m. and 5 p.m. during the three consecutive weekday period containing the weekday temperature with the hottest temperature of the year. " Spillover was reviewed but not directly analyzed in the evaluation. ED policy is to not count spillover in 2006-2008 (See Finding of Fact 27 of D. 05-04-051). Omitted savings, such as the kWh savings for greenhouse projects, were addressed. Omitted savings are savings for program projects that were not acknowledged in the ex-ante analysis.			
01/11/2010	**PG&E Company**	**Impact of economic recession on results**	**3**		**Add Note**
	Question:	You acknowledge sensitivity of results to "volume of production or facility utilization". Given that we're living a deep recession--how big was this effect? How did you assume it to play out over time for your lifecycle savings estimates? How did you estimate pre 2008 conditions for determining 2006-07 savings?			
	Answer:	9. KEMA did not calculate the effects of production changes. Energy Division determined that economic conditions would not be taken into account in estimating savings in the 2006-2008 evaluation, as has been standard practice in energy efficiency evaluations in California. [See the document titled *Non-Adjustment of Evaluation Results for Economic Conditions in 2006-2008 Energy Efficiency Evaluation*, which is posted separately as "Economic Conditions Paper"]. The evaluators utilized current production levels and made no assumptions about how they would change over time. Pre-2008 conditions were estimated on a project-by-project basis as needed; see site reports.			
01/11/2010	**PG&E Company**	**Study assumptions**	**3**		**Add Note**
	Question:	Can the details for which EEMs interval data were collected, as well as other key assumptions in the calculations be found in the report appendices? If so, where?			
	Answer:	10. Documentation is provided in Appendices C and D. Additional information was provided to PG&E in response to data requests.			

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01/11/2010	**PG&E Company**	**Projects with no savings**	**13**		**Add Note**
	Question:	Table 8 includes "projects with no savings." Please explain why there were no savings for these. You say these were pump retrofit application assistance in all but 2 instances.			
	Answer:	11. There are no savings because the PG&E tracking system contained entries with zero savings.			
01/11/2010	**PG&E Company**	**Table values verification**	**13**		**Add Note**
	Question:	Are the overall values in Table 8 correct? Is there some reason why there are not column sums?			
	Answer:	12. Values are correct. Rows are not mutually exclusive so they cannot be summed.			
01/11/2010	**PG&E Company**	**Small commercial verification**	**21**		**Add Note**
	Question:	Why have Small Commercial Verification of Ag/FP sites? Can we get a disposition of what programs were evaluated, where, and how were the sites distributed across the various evaluation efforts? What did you use when the Small Commercial Verification report findings differed from the on-sites?			
	Answer:	13. The Small Commercial evaluation did verification surveys on a number of greenhouse HIM sites before they were assigned to the Ag-Food evaluation. When the Ag-Food evaluation was assigned the greenhouse HIMs, we utilized these survey data in addition to follow-up telephone data to analyze some of the greenhouse projects, instead of conducting additional on-site surveys of the same facilities.			
01/11/2010	**PG&E Company**	**No-response**	**23**		**Add Note**
	Question:	How often did evaluators encounter resistance from customers to visit their sites? Do you have recommendations to minimize non-response in future evaluations?			
	Answer:	14. We encountered resistance at a number of sites, but we were able to visit all but three of these sites. In some cases we enlisted utility assistance to gain access to sites, and continued cooperation between the utility and the evaluator is recommended to minimize non-response.			
01/11/2010	**PG&E Company**	**Case weights**	**29**		**Add Note**
	Question:	Tables 15 and 16 provide case weights for the HIMs. Please provide case weights for the sites sampled for the PG&E A&FP evaluation. Because the samples for the gross impact and NTG analysis are different, please provide case weights for both analyses.			

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	Answer:	15. See Tables 17 and 18 in the Evaluation Report for the Ag-Food weights. The NTG analysis did not rely on case weights; energy savings were used as weights.			
01/11/2010	**PG&E Company**	**Sensitivity analyses**	**31**		**Add Note**
	Question:	Did the evaluator conduct sensitivity analyses for other "gamma" values?			
	Answer:	16. No sensitivity analyses for other "gamma" values were conducted.			
01/11/2010	**PG&E Company**	**Greenhouse Heat Curtain and Infrared Film Measures**	**2.3/31**		**Add Note**
	Question:	The report states, "[w]e did not achieve our desired sample sizes for the NTG surveys because of implementation logistics, mostly related to customers not responding to repeated calls." please provide responses to individual phone surveys that were conducted and responses for both the completed and the incomplete interviews.			
	Answer:	17. KEMA provided PG&E with all available NTG survey results as a response to a PG&E data request.			
01/11/2010	**PG&E Company**	**Sample Sizes**	**2.3/31**		**Add Note**
	Question:	The gross realized savings analysis for heat curtains and infrared film are based on the use of a calibrated version of eQuest. The report indicates that only six sites were used to develop calibration factors. Why were so few sites used? How accurate were the un-calibrated simulations, and how severely were they calibrated? Given that simulation results can be calibrated using a variety of such factors, how were specific calibration factors determined?			
	Answer:	18. Evaluators would have liked to calibrate to more than 6 sites, but were limited by time-of-year and resources. The accuracy of the un-calibrated simulations is not known; they were calibrated such that all relevant site-specific data that was collected during site visits was input into the simulation. Calibration factors were determined through an iterative process that included review of previous greenhouse analysis efforts and a differential sensitivity analysis on a pilot greenhouse model.			
01/11/2010	**PG&E Company**	**Sample Sizes**	**32**		**Add Note**
	Question:	Table 21 - Only 5 of the 10 NTG surveys were completed amongst the largest stratum customers. What percent of total savings did these 5 surveys represent? How did that affect the reliability of the NTG for that stratum? For gas (table 22), the percentage of completed surveys was also very low for the 2 middle stratum (3 out of 18 completes). What was the impact there? Please provide stratum-specific results for these small sample sizes.			
	Answer:	19. This information can be found in the evaluation report, in addition to data			

Date	Author	Subject	Section/Page	Attachment	Issue Resolution
		responses provided to PG&E.			
01/11/2010	**PG&E Company**	**Nonresponse bias**	**32**		**Add Note**
	Question:	Tables 20 through 22 indicate significant non-response for the NTG surveys for infrared film and the PG&E Agricultural and Food Processing Program (A&FP). What accounts for this non-response, and was any analysis of potential non-response bias undertaken?			
	Answer:	20. Non-response was the result of not being able to reach some customers within the survey time frame and some customers refusing to complete surveys. KEMA did not analyze non-response bias.			
01/11/2010	**PG&E Company**	**SRA-based NTG analyses**	**2.3.2 pg 32**		**Add Note**
	Comment:	Having common decision rules, though it helps deal with inter-reviewer biases, can nevertheless also lead to bias in the results of SRA-based NTG analysis. Did you consider other information or triangulation with other methodologies and/or scoring rules to check on this potential bias?			
	Response:	21 The methodology calls for integration of results from multiple data sources in the final NTGR. These sources can include: any of the following: Account Representative Interview,;Utility Program Manager/Staff Interview,; Utility Technical Contractor Interview; Third party Program Manager Interview; Evaluation Engineer Interview,;Gross Impact Site Plan/Analysis Review; Corporate Green/Environmental Policy Review (if mentioned as important); Corporate Standard Practice Review (if mentioned as important); Industry Standard Practice Review (if mentioned as important); Corporate payback review (if mentioned as important); Review relevant codes and standards, including regulatory requirements,;Review industry publications, websites, reports such as the Commercial Energy Use Survey, historical purchase data of specific measures etc. KEMA applied the CPUC approved NTG method and such data integration was performed in some of the cases.			
01/11/2010	**PG&E Company**	**NTG self-report battery**	**33**		**Add Note**
	Question:	The surveys used 0-10 scores for 3 batteries of questions, yet people can't distinguish between an 8 and a 10, and tend to shy away from a 10. How did you account for this when getting an overall score?			
	Answer:	22. The evaluators disagree with the assertion that people cannot distinguish between an 8 and a 10. In the responses provided, interviewees were clearly able to distinguish between all 11 points on the 0 –to-10 point continuum. Responses provided were very diverse and did not tend toward a central point (e.g., 5) or to the 2 extremes, as might be suggested by this question.			
01/11/2010	**PG&E Company**	**NTG self-report battery**	**35**		**Add Note**

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	Question:	Please explain why the "NO-Program" battery of questions was given the same weight as the "timing" and "program influence" scores? How are these two independent. Doesn't this amount to applying a factor two times to some degree?			
	Answer:	23. The No Program battery captures the likelihood of various actions the customer might have taken at this time and in the future if the program had not been available (the counterfactual). This score also accounts for deferred free ridership by incorporating the likelihood that the customer would have installed program-qualifying measures at a later date if the program had not been available. As explained more fully in the document entitled, "Methodological Framework for Using the Self-Report Approach to Estimating Net-to-Gross Ratios for Nonresidential Customers," posted as "Commercial SRA_Response," the three scores represent different aspects of program influence and all are important. The evaluators disagree with the assertion that the No Program battery is overlapping with the Timing and Selection and Program Influence batteries. As the Methods document explains, these three sets of questions all seek to tease out the influence of the program, but in distinctly different ways			
01/11/2010	**PG&E Company**	**NTG self-report responses**	**36**		**Add Note**
	Question:	How often did you face the "don't know" or "no data" situation? Which projects were these? What were their weights for the overall NTG?			
	Answer:	24. These "don't know" responses were very rare. There were only three instances of 'don't know' answers and all three were for responses considered in the Timing and Selection score. Two of the three responses were provided by the same interviewee, yet there were also 13 other responses from them that fed into their Timing and Selection score, so it was able to be calculated. We provided PG&E with all available NTG survey results as a response to a PG&E data request			
01/11/2010	**PG&E Company**	**GHG heat curtain results**	**40**		**Add Note**
	Question:	Please explain why the 2 largest sites for GHG heat curtains were so low. How did they affect the overall realization rates? Given that they were outliers, what would be the realization rates w/o them?			
	Answer:	25. The two largest sites are low largely because several of the greenhouses that were included in these applications were rebated for 2-curtain systems. This resulted in low realization rates because savings were estimated for the 2-curtain installation as 2 x deemed savings, which is an overstatement of the measure savings when 2 curtains are installed as a double layer for a single space. We did not assess the effects of these 2 sites on realization rates, The report contains sufficient information for PG&E to conduct this analysis.			
01/11/2010	**PG&E Company**	**Table values verification**	**42**		**Add Note**

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	Question:	Table 26 combines (mixes) building square footage and measure square footage, and the footnotes do not appear to clarify matters. Please clarify.			
	Answer:	26. Square footages differ in cases where one of the following occurred: (1) greenhouses were rebated for two layers of heat curtains or (2) greenhouses were rebated for a heat curtain sq.ft. that exceeded the floor area of the greenhouse. Angled covers is one example of a cause for the latter.			
01/11/2010	**PG&E Company**	**NTG scores**	**44**		**Add Note**
	Question:	Table 28 presents NTG scores, rather than NTG ratios; however, the discussion of this table is cast in terms of ratios.			
	Answer:	27. This table was corrected the day after the report was initially posted after PG&E brought this error to our attention. Table 28 in the currently posted report contains NTG ratios.			
01/11/2010	**PG&E Company**	**Greenhouse Heat Curtain and Infrared Film Measures**	**4.3.2/62**		**Add Note**
	Comment:	PG&E has already implemented some of the evaluation's recommendations. PG&E raised its rebate from $0.03/sq. ft. to $0.05/sq. ft. on November 1, 2009 to align with SDG&E and SoCal Gas. PG&E has known for some time that IR film might be built into greenhouse heat curtains. Climate zones are already used to calculate deemed savings in the work paper. The evaluator's recommendations would increase quality control inspection and application processing costs and reduce customer's satisfaction with the program. Did these recommendations take into account the cost and potential impact on participation these would have?			
	Response:	28. Cost and impact on participation were not within the scope of the evaluation and therefore were not taken into account.			
01/11/2010	**PG&E Company**	**Realization rates**	**65-66**		**Add Note**
	Question:	The overall realization rates shown in Table 49 appear to be un-weighted. Is this the case? How do the overall realization rates in Table 49 relate to the Gross Realization Rates presented in Table 1?			
	Answer:	29. The overall realization rates shown in Table 49 are un-weighted. See Section 2.2.3 of the main report to see how gross realization rates in Table 1 were developed.			
01/11/2010	**PG&E Company**	**Baselines**	**General**		**Add Note**
	Comment:	There appear to be situations where the baseline was site-specific instead of relying on industry standard. To develop a gross savings estimate the baseline should use industry standard and let the NTGR correct for the impact of a			

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		particular customer installing more efficient equipment because of previous program influence, or because they happen to be more energy conscious.			
	Response:	30. The NTGR did not address partial free ridership. This effect was incorporated into the baselines, per CPUC direction.			
01/11/2010	**PG&E Company**	**Invalid Analysis Methodology**	**General**		**Add Note**
	Comment:	The use of the International Performance Measurement and Verification Protocol (IPMVP) is not followed completely and its use appears to be suspect given the lack of baseline measurements. For example, comparing energy usage values from estimation software for the baseline condition with the use of actual measured performance for the post-retrofit energy consumption.			
	Response:	31. Use of IPMVP is a guideline that was adhered to whenever possible. The lack of baseline measurements reflects incomplete project documentation by the implementer.			
01/11/2010	**PG&E Company**	**NTG Analysis**	**General**		**Add Note**
	Comment:	NTGR self-report survey, besides the many threats to validity it faces and not counting spillover, also does not appear to capture fully the variety of efforts through which the programs influence customer action in energy efficiency. It is quite likely that only some of the many activities carried out by the program are the ones that lead to the desired customer action. Yet the NTGR analysis appears to require high scores of influence from all these activities: technical assistance, financial incentives, and endorsement of energy savings. Therefore it would be more appropriate to take the highest instead of an average score to develop the NTGR. If for example a customer needed the technical assistance but not as much the incentive, then the importance that technical assistance played to ultimate customer adoption is what matters and the program's ultimate influence score should not be lowered by the lower score ascribed to the incentive.			
	Response:	32. The evaluators disagree with the assertion that the NTG self-report framework faces many threats to validity and in support of their position, the evaluators refer you to the White Paper entitled, “Response to Overarching IOU Concerns Regarding the Estimation of the Net-To-Gross Ratio Using the Self-Report Approach,,” posted separately as “Commercial SRA_Response.” In addition, the following statement is incorrect: ‘that the NTGR analysis appears to require high scores of influence from all these activities: technical assistance, financial incentives, and endorsement of energy savings.’ The NTG analysis relies on the scores provided by the respondent, high or low. The algorithm does take the highest of the scores provided, **not** an average, to determine the Timing and Selection score. In the example given, if program-provided technical assistance received the highest score it is used to determine the Timing and Selection score, and is not averaged with the scores provided for the other program and non-program elements.			

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01/11/2010	**PG&E Company**	**Ex post savings modeling**	**General**		**Add Note**
	Question:	The precision levels cited in the report take into account error ratios, which in this case, relate to the correspondence between ex ante estimates and actual savings. However, site-level ex post realized savings are estimated (modeled) by the evaluator, rather than observed directly, and the computed precision levels do not reflect errors in this estimation process. Was this kind of modeling error (e.g., errors in using simulation models to estimate actual savings) was considered in computing precision? How significant is modeling error for the specific techniques used in the evaluation, and what general impact does it have on precision?			
	Answer:	33. This comment appears to confuse *measurement error* with *sampling error*. Measurement error can be minimized (never completely eliminated) through the thorough training of both field personnel and modelers that would cover such basic topics as: 1) Data Collection, 2) Base Case Construction, 3) Estimating simple non-interactive measures, 4) Simulations of Load Interactions, and 5) Model Calibration. Sample error can be reduced by increasing the size of the sample. The precision of the estimate is a function of the standard error, the size of which is driven by the standard deviation and the size of the sample. Measurement error is not taken into consideration.			
01/11/2010	**PG&E Company**	**Co-mingling of respondents**	**General**		**Add Note**
	Question:	Footnote #1 states that all projects identified as new construction were reassigned to the New Construction Codes and Standards evaluation. However the New Construction Codes and Standards draft evaluation study made a contradictory claim. Several projects in the PG&E Ag/FP evaluation sample were new construction projects, so it appears that the Ag/FP and New Construction Codes & Standards evaluation samples are either not mutually exclusive or have comingled new construction (NC) and retrofit (NRR) projects. Please clarify the coverage and treatment of new construction projects in this and other evaluation studies. Given how different NC and RR projects decision making are, should you not have reported results for each separately?			
	Answer:	34. The footnote states that all commercial new construction projects were reassigned to the New Construction Codes and Standards evaluation. Results are being reported by program, and PG&E decided to aggregate these projects in the same program.			
01/11/2010	**PG&E Company**	**NC vs. NRR projects**	**General**		**Add Note**
	Question:	NC and NRR project types are significantly different with respect to the establishment of baselines, program delivery, and application processing and review. How were these differences accounted for in the evaluation?			
	Answer:	35. Each project evaluation was planned for and executed in a custom fashion. This approach allowed for differences in project type.			

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01/11/2010	**PG&E Company**	**Baseline methodology**	**General**		**Add Note**
	Question:	Please clarify the methodology for determining the appropriate baseline for "non-Title 24" projects - such as greenhouses - and explain how the baseline determination would affect the NTG results.			
	Answer:	36. Baselines were determined on a case-by-case basis and are documented in the site reports. The NTG results do not address partial free-ridership and are not affected by the baseline determinations.			
01/11/2010	**PG&E Company**	**NTG analysis**	**General**		**Add Note**
	Question:	In addition to rebates, PG&E A&FP Program provided on-site audits, engineering support, and specialized training. To what extent were these non-incentive activities of the Program considered to be decision influencers and therefore, actions that would increase attribution to PG&E efforts? How were non-incentive program attributes included in the NTG analysis and what was the approach for determining the influence of these program services relative to the financial incentives? In addition to offering program services to customers mentioned above, the Ag/FP program worked with equipment vendors, distributors, and other market actors. Were these activities examined and accounted for in the evaluation (specifically in the attribution analysis)?			
	Answer:	37. The NTGR approach as applied in this evaluation is founded on the recognition that numerous program-related factors contribute to overall program influence. The battery of questions used asks about the influence of a number of program-related factors, and other non-program factors in that context. In the non-residential NTGR questionnaire, a series of questions ask the respondents to rate the importance of a number of factors in their decision to implement energy efficient measures, including six program-related factors (e.g., the audit or technical assistance provided by the program, the availability of the program rebate and the endorsement or recommendation by IOU account representative). The highest of these program-related factors is selected. In addition, respondents are asked to score the importance of the program vendor in their decisionmaking. For those sites that indicate the vendor was very influential in decision making, the vendor survey results enter directly into the NTGR scoring. The vendor survey findings are also be used to corroborate Decision Maker findings, particularly with respect to the vendor's specific role and degree of influence on the decision to implement the energy efficient measure. Vendors are queried on the program's significance in their decision to recommend the energy efficient measures, and on their likelihood to have recommended the same measure in the absence of the program. Generally, the vendors contacted as part of this study are contractors, design engineers, distributors, and installers, but can also include retailers and manufacturers..			
01/11/2010	**PG&E Company**	**Sample frame**	**General**		**Add Note**
	Question:	Were the HIM measures excluded from the sample frame for the PG&E Ag/FP			

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		sample? How should the overall realization rate(s) be applied the program going forward - use one set of values for HIMs and another for all other Ag/FP measures?			
	Answer:	38. Only one Ag-Food project overlapped a HIM evaluation. The determination of program realization rates is part of the CPUC process for developing Energy Division's final report on the evaluations.			
01/11/2010	**PG&E Company**	**Greenhouses**	**General**		**Add Note**
	Question:	How can we confirm the calculations done for estimating savings in Greenhouses?			
	Answer:	39. The necessary information was provided in the Ag-Food evaluation report and appendix and the related data that was provided upon request.			
01/11/2010	**PG&E Company**	**Climate zone variations**	**General**		**Add Note**
	Question:	It would be helpful to understand which measures (if any) have realization rates or net of free-ridership scores that vary across climate zones or customer size strata. (With respect to wine tank insulation, for example, are wineries in the central valley or large corporate wineries more likely to insulate without the program?).			
	Answer:	The information necessary to conduct this analysis was provided in the evaluation report and in response to data requests.			

E.2 PG&E Cover Letter and Responses

January 11, 2010
Ms. Zenaida Tapawan-Conway
Energy Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Comments posted on www.energydataweb.com/cpuc

RE: Draft Evaluation Report: PG&E *Agricultural and Food Processing Program; Greenhouse Heat Curtain and Infrared Film Measures*

Dear Ms. Tapawan-Conway:

Pacific Gas and Electric Company (PG&E) acknowledges the evaluators' effort in drafting this report and appreciates the opportunity to submit these comments. PG&E also appreciates Energy Division's (ED) efforts to present evaluation findings through webinars and to respond quickly to PG&E's data requests that followed.

Pacific Gas and Electric Company (PG&E) respectfully submits the following questions and comments to the *Draft Evaluation Report: PG&E Agricultural and Food Processing Program; Greenhouse Heat Curtain and Infrared Film Measures.* PG&E provides its comments in three sections: (1) an Executive Summary that provides a high-level discussion of the reports; (2) PG&E's detailed comments to specific items in the reports, presented in spreadsheet format. PG&E posted its detailed comments on www.energydataweb.com/cpuc and also attaches them as "Attachment A" for your convenience; and (3) detailed comments in "Attachment B" to the Site-Specific Measurement and Verification Reports that were not publicly-posted by the Energy Division. The comments in Attachment B refer to and discuss the information in the non-public site-specific reports, and also contain confidential, market sensitive, proprietary customer information, which if publicly disclosed could place PG&E's customers at a competitive disadvantage. Therefore, rather than post these comments publicly, PG&E is submitting Attachment B under separate cover to Energy Division pursuant to California Public Utilities Code section 583 and General Order 66-C.

A. EXECUTIVE SUMMARY OF COMMENTS

As an initial matter, PG&E notes that it was not able to perform a robust review of all the calculations or attempt to replicate results due to the significant time constraints of the comment period. We appreciate and recognize the dedication of both CPUC-ED and their evaluation consultants to respond to our data requests that sought clarifications on methods, assumptions and data used in the energy savings analyses. Unfortunately, the responses received addressed only some of the information needed. Given the information available and the significant time constraints, the full analyses needed to fully replicate the evaluation results could not be conducted. Nevertheless, PG&E wishes to highlight the following comments with respect to this evaluation effort and submit recommendations for addressing certain issues in the future.

Energy Division Response: We appreciate the utilities' time and effort spent in reviewing and commenting on the draft evaluation reports. However, ED is working under strict deadlines as set by the Commission, and that transferred into the scheduled review period

The report contains various methodological weaknesses, which call into question the validity and reliability of its conclusions. Specifically, (1) significant differences exist regarding baseline conditions and definitions and/or the use of current production levels to estimate savings; and (2) savings estimates were significantly reduced by net-to-gross ratios (NTGR) based primarily on an unreliable self-reporting methodology and/or small sample sizes which produced questionable results. We present first, a brief discussion of issues applicable to the report as a whole, and then individually for the Agricultural and Food Processing Program and the High Impact Measures.

ED Response: The evaluation complied with evaluation protocols and the direction of CPUC staff with regard to baselines, production levels, and net-to-gross analysis.

1. General Methodology Problems

The following are examples of issues with the methodology employed by the evaluators with respect to the report in general:

A. Failure to account for effects of recession
It appears that sites were evaluated at production levels found in late 2008 and early 2009, which may have been significantly lower than production levels assumed for the ex ante estimates due to the recession. A more realistic evaluation to estimate lifetime impacts would have utilized actual 2006-08 production data or an average that represents normal production rates rather than production that reflects recessionary effects.

ED Response: Actual, observed production levels were utilized in the analysis, per CPUC direction. Energy Division determined that economic effects would not be taken into account in estimating savings in the 2006-2008 evaluation, as has been standard practice in previous energy efficiency evaluations in California. [See "Energy Division Policy on Consideration of Economic Conditions in the 2006-2008 Evaluation," posted separately as "Economic Conditions Paper."

B. Inappropriate assumptions for relatively new sites
It is fairly common for evaluators to use existing conditions at sampled sites to develop assumptions for energy savings algorithms. This may be sensible for relatively mature sites; however, it may not be warranted for sites that are in the process of being built out or undergoing significant expansions. It is not uncommon for energy efficiency activities to occur in such sites (and in fact be at least partly motivated by anticipated increases in operations). In spite of the relative simplicity of using observed current conditions to estimate savings, the fundamental goal of evaluation is to estimate lifetime savings, and this may require making reasonable assumptions about planned expansions at participating sites.

ED Response: Existing conditions were utilized in the analysis, per CPUC direction. It is not within the scope of these evaluations to normalize for possible future conditions.

C. Failure to account for spillover

Per CPUC directive, the overall NTGR methodology ignores a primary benefit of the program on behavior in this sector: spillover. As indicated above, the features of this program undoubtedly lead to effects on efficiency choices by non-participating sites that were excluded from the analysis. The further contributed to the unreliability of the NTGR estimates.

The net-to-gross analysis presented in the KEMA report addressed only free-ridership. While this may be the general practice in this round of evaluations, it seems unwarranted and unwise, especially for programs that can be expected to have market effects over and above the direct impacts on participants. The PG&E Agricultural and Food Processing Program is a good case in point. It offered on-site audits, engineering support, and specialized training to decision-makers; moreover, it worked with equipment vendors, distributors and other market actors who perform as influencers to decision makers. These program activities could clearly have spillover effects that should to be considered in any evaluation.

> ED Response: ED policy is to not count spillover in 2006-2008. See Finding of Fact 27 of D. 05-04-051: "27. The speculative nature of any attempts to quantify spillover effects significantly reduces their applicability as an analytical tool at this time. Moreover, discounting the accounting of free-ridership through 'spillover,' as PG&E proposes, would make it particularly difficult to attribute indirect program benefits to education and information programs, without double-counting those benefits."

D. Overstatement of confidence intervals

It is traditional in the field of evaluation to present confidence intervals for estimates of savings. In general, though, these intervals take into account only sampling error (the statistical variation associated with analyzing a sample of sites rather than all participating sites). However, another source of error—measurement, or modeling error—generally occurs in studies of this sort, and it is seldom integrated into the confidence intervals. In the case of this evaluation, the measurement error associated with engineering algorithms and simulation models used to estimate savings for sample sites is undoubtedly significant. Thus, the confidence intervals overstate the precision of the estimates of program savings.

> ED Response: The confidence intervals provided in the report are consistent with standard practice in the evaluation field and reflect statistical sampling precision. Both ex-ante and ex-post measurement and modeling error are not factored into the precision estimates.

E. Changing methodology to High Impact Measure review

One key factor in determining the appropriate allocation of evaluation resources is the level of uncertainty associated with a particular measure, application, or even program. One important observation to note here is that the Energy Division's shift to examining HIMs shifted evaluation resources away from the evaluation of third-party programs (and other PG&E administered programs). This exclusion is disservice to third party implementers, many of which have been running programs for several years with little to feedback on program performance.

ED Response: In Decision 07-09-043, the Commission recognized that its staff may not have the resources to verify each parameter on an ex post basis for every program, and that the EM&V protocols provided staff with the flexibility to establish priorities for the EM&V efforts throughout the program cycle. We believe that the HIM results can provide important gross savings information to program managers, even if their program was not included in any of the HIM sample frames. The administrative structure set up by Decision 05-01-055, under which these evaluations are still governed, provided the IOUs with authority to conduct process evaluations to provide feedback to third-party programs.

2. Evaluation of the PG&E Agricultural and Food Processing Program

A. Estimation of Gross Ex Post Impacts

Detailed reviews by PG&E's program staff that are intimately familiar with the projects point to a variety of errors in characterizing the sites covered by the simulation analysis, as well as characterizing the measures installed. Examples of recurring observations made by PG&E program staff include the following:

- eQuest is not appropriate for modeling refrigeration sites;
- Program measures (e.g., raising suction temperatures) are missing at some sites;
- Increases in site loads are not fully recognized;
- Service addresses of some sampled sites are incorrect; and
- Incorrect pre-treatment conditions (tonnages, condensing temperatures, etc.) are used.

In addition, the draft report noted that "[b]aseline definitions affected realization rates more than any other factor" (p.77). This is significant, particularly because of the unique and diverse projects funded through the Agricultural and Food Processing Program. PG&E staff raised specific issues and discrepancies (many of which were related to the baseline determination) with the evaluation contractor during a meeting on December 17, 2009, and submitted a data request on that same day. These issues are discussed in detail in the specific comments attached hereto.

ED Response: Responses on these issues are provided to the specific comments submitted by PG&E.

B. Estimation of Net-to-Gross Ratios

The use of self-report surveys is subject to a large variety of difficulties that can affect the accuracy and precision of NTG values (as detailed in Appendix B and the *Guidelines for Estimating Net-To-Gross Ratios Using the Self-Report Approaches* developed by the CPUC and its consultants). Two key issues may have affected this evaluation's results: 1. Timeliness of survey. Surveys took place long after the customers made the decision to purchase the EE equipment; and 2. Non-response bias. The evaluation contractor attempted to survey decision-makers from all of the sites included in the gross saving analysis; however, the response rates for this program were fairly low (71% for the

electric sample and 50% for the natural gas sample). These response rates are a concern, in that there may be systematic non-response bias in the NTGR estimates.

More importantly, the NTGR approach is not well suited to identifying and attributing the full value of the programs as it does not align with how the programs operate in the market to increase energy efficiency uptake nor customer's decision-making. The NTGR focuses on the question of whether or not a customer would have decided to actually implement a particular project absent the IOU program. However, the IOUs often work with customers to add EE components to projects that customers have already decided to do. Utility personnel work with customers providing technical assistance, endorsement value and incentives, to increase the likelihood that energy efficiency components will be integrated in capital projects under consideration. Via this process, the program in some cases enhances customer in-house focus on energy efficiency and even institutional managerial changes. These changes take place over time and several projects. The NTGR approach used examines a much more limited set of influencing factors and compounds the problem by averaging scores for these instead of picking the highest score. For example, the program's key role may be to establish a technically sound project, yet this influence score is averaged with other scores that may be lower simply because they were less important to make the project happen. The NTGR approach goes counter to the wide body of industrial decision-making literature such as ACEEE, LBNL, and recently, Dr. Michael Sullivan's white paper (Behavioral Assumptions Underlying Energy Efficiency Programs for Businesses) prepared for the CPUC-ED EE behavior series.

> ED Response: A number of comments have been received from the IOUs claiming that the self report approach (SRA) is an invalid method for estimating the net-to-gross ratio. Some comments appear to quarrel not so much with the SRA itself but with a failure to adequately address a number of methodological challenges in its application. These issues are addressed in "Response to Overarching IOU Concerns Regarding the Estimation of the Non-residential Net-To-Gross Ratio Using the Nonresidential Self-Report Approach" [posted separately as "Commercial SRA_Response"], whose objectives are to demonstrate that:
>
> 1. The methodological principles underlying the SRA are endorsed by leading evaluators.
> 2. The IOUs have a long tradition of relying on the SRA and have actively participated in its continuing development.
> 3. The SRA has incorporated many of the techniques that have become standard in survey research to mitigate the technical challenges raised by the IOUs.

3. Evaluation of the High Impact Measures

A. Estimation of Gross Impacts

KEMA used eQuest, a building simulation model, to estimate the gross program impacts of heat curtains and infrared film. This methodology produced questionable conclusions. The model was calibrated to ***only six sites***, and then broadly applied to estimate HVAC usage of all of the sampled sites with and without the HIM in place. KEMA estimated gross realization rates of only 0.63 and 0.39 for the gas savings from heat curtains and infrared film, respectively. The gross savings analysis has several weaknesses.

First, eQuest is never designed to simulate greenhouse HVAC loads. The calibration of the model to only six sites does not tailor it to the more general analysis of overall sample of greenhouses. Few

general calibration rules can be derived from such a small sample, especially since consistent types of usage data were not available for these sites. Documentation of the actual calibration process is weak at best. Second, there are a number of apparent anomalies in KEMA's estimates of site-level impacts. For instance, PG&E2 is one of the few sites with double heat curtains, yet has one of the lowest percentage savings estimates. Third, KEMA made no attempt to assess the model error associated with its simulation approach. This error is totally absent from the confidence intervals presented in the report. Given the use of a simulation model to estimate gross impacts and the lack of data necessary to calibrate the model to the full range of sampled sites, the degree of precision is likely to be significantly overstated and uncertainty in the results much larger.

ED Response: Evaluators would have liked to calibrate to more than 6 sites, but were limited by time-of-year and resources. The accuracy of the un-calibrated simulations is not known; they were calibrated such that all relevant site-specific data that was collected during site visits was input into the simulation. Calibration factors were determined through an iterative process that included review of previous greenhouse analysis efforts and a differential sensitivity analysis on a pilot greenhouse model.

We note that the eQuest model is used to establish ex-ante impacts. The evaluation improved upon the ex-ante modeling approach by calibrating the eQuest model to site data and by utilizing site-specific (versus generic data) to establish savings for all the sites included in the study. A key factor affecting program realization rates is the fact that ex-ante assumptions about greenhouse features (such as greenhouse heater type) were not borne out by the site data collected for the evaluation.

PGE included several greenhouses that were rebated for double heat curtain installations. This resulted in low realization rates largely because savings were estimated for the 2-curtain installation as 2 x deemed savings, which is an overstatement of the measure savings. Differences in assumed baseline system types (i.e. underbench heating instead of unit heaters) and setpoints were also contributing factors to the low realization rates for this project.

B. Estimation of Net-to-Gross Ratios for HIMs

KEMA developed net-to-gross ratios (NTGRs) for HIMs using the same self-report approach used for the Agriculture and Food Processing Program. Where applicable, the evaluation contractor conducted surveys with vendors to obtain supplemental information on participant motivation. The recognition of vendor influence for these HIMs, again, raises the prospect of spillover effects, which were excluded from the analysis, as well as the other general issues with the self-reporting methodology discussed above.

ED Response: As noted above, ED policy is to not count spillover in 2006-2008. See Finding of Fact 27 of D. 05-04-051: "27. The speculative nature of any attempts to quantify spillover effects significantly reduces their applicability as an analytical tool at this time. Moreover, discounting the accounting of free-ridership through 'spillover,' as PG&E proposes, would make it particularly difficult to attribute indirect program benefits to education and information programs, without double-counting those benefits. "

B. CONCLUSION

Pacific Gas and Electric Company appreciates the opportunity to submit these questions and comments to the *Draft Evaluation Report: Agricultural and Food Processing Program; Greenhouse Heat Curtain and Infrared Film Measures.* Given the shortcomings of some of the methodologies applied, as well as the existence of significant reductions to savings estimates based on unreliable NTGR methodology, the reports' findings are not reliable and do not represent an accurate measure of the program's performance.

PG&E's public comments have been posted on www.energydataweb.com/cpuc**.** Questions regarding PG&E's comments should be directed to Rafael Friedmann at (415) 972-5799 or email to RAFI@pge.com.